



Biodiversity of the short horned grasshoppers of the tribe Oedipodini (Orthoptera: Acrididae: Acridinae) in Kashmir Himalayas

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Abstract

Tribe Oedipodini is redefined. Key to genera of Oedipodini found in Kashmir and diagnostic characters of each genus are given. Key to species wherever necessary along with their habitats are also given.

Keywords: Biodiversity, Oedipodini, Kashmir.

Tribe Oedipodini Scudder, 1875

The tribe Oedipodini can be characterized as follows:-

Body somewhat sturdy; antennae always filiform; fastigial foveolae present or absent, if present they are never contiguous in front, often they are small or triangular, more rarely oblong trapezoidal, but not quadrangular; frons vertical; pronotum usually without lateral carinae, if present, they are weak and less developed, median carina in some species high; tegmina and wings well developed, tegmina with spurious median vein strong, in some species absent or weak; wings often brightly marked with different shades of blue, dark blue, red or yellow, quite often with a black band; arolium small.

Key to genera of the tribe Oedipodini Scudder found in Kashmir

1. Dorsum of pronotum without x-shaped pattern.....2
----Dorsum of pronotum with x-shaped pattern.....*Oedaleus* Fieber

2. Median carina of pronotum intersected by two

transverse sulci.....3
---Median carina of pronotum entire or intersected by only one transverse sulcus5

3. Body small to medium size; median carina of pronotum not forming teeth like projection4
---Body small; median carina of pronotum forming teeth like projections..... *Trilophidia* Stal

4. Frontal ridge flat or with a depression near median ocellus; pronotum longer than its width, with angular posterior margin..... 9
----Frontal ridge with a groove throughout its length; pronotum as long as or shorter than its width, with widely rounded posterior margin.....*Acrotylus* Fieber

5. Pronotum with well developed median carina.....6
---Pronotum with weak median carina.....*Aiolopus* Fieber

6. Median carina of pronotum not excised at posterior sulcus..... 7

----Median carina of pronotum slightly excised at posterior sulcus.....8

7. Antennae longer than head and pronotum together; frontal ridge shallowly sulcate; pronotum not crest like, angulated behind with the tip rounded off.....*Dittopternis* Saussure

----Antennae shorter than head and pronotum together; frontal ridge flat; pronotum crest like, acutely angulated behind.....

.....*Gastrimargus* Saussure

8. Antennae about as long as head and pronotum together; frontal ridge flat; median carina of pronotum equally raised in prozona and metazon, slightly excised by posterior transverse sulcus; wings without a dark transverse band; thorax ventrally with dense hairs.....

.....*Locusta* Linnaeus

----Antennae slightly longer than head and pronotum together; frontal ridge sulcate; median carina of pronotum strongly raised in prozona and moderately in metazon, deeply excised by only one transverse sulcus; wings with a dark transverse band or the band may be weak or absent; thorax ventrally without dense hairs.....*Oedipoda* Latreille

9. Tegmina with spurious median vein strongly approaching M apically; wings usually with a dark band.....*Sphingonotus* Fieber

----Tegmina with spurious vein at equidistant from M and CuA; wings without a dark band.....*Leptopternis* Saussure

10. Pronotum with small sparse tubercles, lower margin of hind femur with long dense hairs.....*Pternoscirta* Saussure

----Pronotum without small sparse tubercles, lower margin of hind femur without long dense hairs.....*Epacromius* Uvarov

Genus *Oedipoda* Latreille

Oedipoda Latreille, 1829. In Cuvier, R. Anim. Ed., 2, 5:188.

Type-species: *Gryllus caerulescens* Linnaeus (= *Gryllus caerulescens caerulescens*)

Ctyphippus Fieber, 1852. *Kelch. Orth. Oberschl.*, pp 2.

Distribution: Asia, Europe, N. Africa.

Diagnosis: Small to medium sized insects; antennae filiform, slightly longer than head pronotum together; fastigium of vertex concave, with raised lateral carinulae; fastigial foveolae present; frontal ridge sulcate; pronotum with median carina sharp, distinctly raised, sharply intersected by posterior transverse sulcus; lateral carinae often present, strongly interrupted by transverse sulci and obliterated in metazon, dorsum rugose and tuberculate, metazon longer than prozona, its posterior margin angular; mesosternal interspace longer than wide; tegmina and wings fully developed, wings with dark band, base of wing brightly coloured; arolium small; male with supra-anal plate elongate, angular, cercus conical, subgenital plate conical with obtuse apex, epiphallus with narrow bridge and bilobate lophi; female with ovipositor valves short, tips recurved, ventral valve with external lateral projection.

The genus can easily be distinguished in having pronotum with median carina deeply excised at posterior transverse sulcus and dark band of the wing usually sends off a branch towards the base of the wing. The genus is represented by two species in Kashmir.

Key to species of *Oedipoda* Latr. Found in Kashmir

1. Tegmina with apical half hyaline; wings with dark band narrow reaching upto the posterior wing margin.....*Oedipoda himalayana* Uvarov

----Tegmina with only apex hyaline; wings with dark band wide, reaching upto the mid of posterior wing margin *Oedipoda miniata miniata* (Pallas)

Oedipoda himalayana Uvarov

Oedipoda himalayana Uvarov, 1925. *Mission Babauil Inde, Acrididae*, 22. *Oedipoda himalayana* Uvarov; Bei-Bienko And Mischenko, 1951. *Acad. Nauk. SSR*, 235.

Distribution: Kashmir, Afghanistan, Uzbekistan.

This species has been recorded from Kashmir by Bei-Bienko and Mischenko (1951), but the present authors could not collect any specimen of this species.

Material examined: IARI, New Delhi collection, India: Kashmir, Rising Gorg, 6000ft, 2F, 04.x. 1923 (Fletcher).

***Oedipoda miniata miniata* (Pallas) (Fig. 1)**

Gryllus miniatus Pallas, 1771. Reise. Russ. Reiches., 1: 467.

Oedipoda miniatus (Pallas), Chopard. 1922. *Fauna de France*. 3: 134, 163.

Distribution: Southern Europe, Kazakhstan, West Siberia, Asia, North Africa. The general morphological characters are same as described under genus. The genitalic characters are as follows:-

Males having supra-anal plate with wavy apical margins, tip nearly rounded, cercus elongate, broader at base, narrow apically; epiphallus with bridge narrow, undivided medially, ancorae broad in the middle with pointed tips, lophi bilobate; female with supra-anal plate broad, subtriangular, slightly truncated on sides near apex, covered with setae; subgenital plate with posterior margin wavy, setae present, egg guide short about one and a half times longer than wide; ovipositor valves shorter than lateral apodeme, with blunt tips; spermatheca with apical diverticulum short, pre-apical diverticulum long, much broad, sac like with a tubercle like projection facing towards the tip of apical diverticulum.

Material examined: 5 F, 2 M, Kashmir: Kupwara, Karnah, Gundi Gujran on grass, 9.ix. 2005 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from stony soil with sparse grassy vegetation.

Remarks: This subspecies has been recorded for the first time from Kashmir.

Genus *Sphingonotus* Fieber

Sphingonotus Fieber, 1852. *Kelch. Orth. Overschles*, 2; Fieber, 1853. *Lotos*, 3: 124.

Type-species: *Gryllus locusta caeruleans* Linne.

Distribution: Cosmopolitan

Diagnosis: Medium sized insects; antennae filiform, slightly longer than or about as long as head and pronotum together; fastigium of vertex concave, with lateral and sometimes with median carinulae; fastigial foveolae present, sometimes indistinct; frontal ridge shallowly sulcate; pronotum saddle shaped, narrowed and constricted in prozona, median carina low, thin sometimes indistinct and intersected by three transverse sulci, lateral carinae absent, metazona longer than prozona, its posterior margin obtusely angular, with almost rounded apex; mesosternal interspace longer than wide; tegmina and wings fully developed, spurious median vein of tegmina more convex than the adjacent sector R and M and apically comes closer to M than CuA, wings with coloured base, often with a dark Band of varied length; spurs of hind tibia not specialized; arolium small; male epiphallus with moderately narrow bridge, large ancorae and with bilobate lophi.

The genus can easily be identified on the basis of median carina of pronotum never raised in prozona; female with subgenital plate having acute posterior margin; ovipositor short, with moderately robust valves, ventral valve with externo-lateral projections. In Kashmir the specimens of this species are found in stony soil and wings are usually with a dark band. The genus is represented by four species in Kashmir.

Key to species of *Sphingonotus* found in Kashmir

1. Mesosternal interspace narrow, less than twice as wide as long; wings with dark transverse band well developed and broad2
- Mesosternal interspace wide, twice or more as wide as long; wings with dark band diffused.....*Sphingonotus kashmirensis* Uvarov

2. Wings sky blue near the base3
 -----Wings colourless near the base.....
*Sphingonotus savignyi* Saussure

3. Smaller species; wings with dark transverse band distinctly wide, hardly attenuating towards posterior end.....

..*Sphingonotus balteatus himalayanus* Uvarov

-----Larger species; wings with dark transverse band never wide, conspicuously attenuating beyond middle and towards its posterior end.....*S. longipennis* Saussure

***Sphingonotus kashmirensis* Uvarov**

Sphingonotus kashmirensis Uvarov, 1925.
Mission Babault Inde, Acrididae, 18pp.

Distribution: Kashmir, Eastern Afghanistan.

The species has been described and recorded by Uvarov (1925) and Bie-Bienko and Mischenko (1951) from Kashmir. However the present authors could not collect any specimen of this species from the region.

***Sphingonotus savignyi* Saussure (Fig. 2)**

Sphingonotus savignyi Saussure, 1884.*Mem. Soc. Geneve*,xxviii (9):198,208.

Distribution: India, Pakistan, North Africa, Arabia, Palestine.

The characteristic features of this species same as described under genus and in the key to species.

Material examined: 5 F, 4 M, Kashmir: Kupwara, Karnah, Gundi Gujran on grass, 9.ix.2006 (Shabir A. Reshi); 1 F, 2 M, Baramulla, Gurez, Dawar on grass, 16.ix.2006 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from stony soil having patches of grassy vegetation.

Remarks: This species has earlier been recorded from Kashmir by Bie-Bienko and Mischenko (1951).

***Sphingonotus balteatus himalayanus* Uvarov**
Oedipoda balteata Serville, 1839. *Ins. Orth.* 734.
Oedipoda latifasciata Walker, 1870. *Zoologist*, 28: 2299.

Sphingonotus amaranthinus Saussure, 1884.*Mem. Soc.Phys.Hist.Nat. Geneve*, 28(9): 205.

Sphingonotus bifasciatus Innes Bey, 1919. *Bull. Soc.Ent.Egypte*, 11: 45,48.

Sphingonotus balteatus himalayanus Uvarov, 1923.*J. Bombay Nat. Hist. Soc.* 29: 646.

Distribution: India (Kashmir), Pakistan, Arabia, Egypt.

The species has already been described by Bei-Bienko and Mischenko (1951).

Remarks: This species has earlier been recorded by Kirby (1914) from Kashmir. The present authors however could not collect any specimen of this species from the region.

***Sphingonotus longipennis* Saussure (Fig. 3)**

Sphingonotus longipennis Saussure, 1884. *Mem.Soc.Phys.Hist.nat. Geneve*,28(9):197-203
Sphingonotus Indus Saussure, 1884. *Ibid.* 204.

Distribution: India, Pakistan, Africa, Europe.

The characteristic features of the species are same as described under genus and in the key to the species except in the followings:-

Male with supra-anal plate subtriangular, lateral margins curved medially, cercus elongate, more than twice as long as wide, with rounded apex; subgenital plate wide, flattened, wider than long, apex obtusely rounded, epiphallus with bridge narrow and undivided medially, ancorae broad in the middle, lophi bilobate; female with supra-anal plate subtriangular, covered with setae apically, subgenital plate with wavy posterior margin, setae absent, Jannone's organ present, ovipositor with dorsal valve much shorter than lateral apodemes, spermatheca with apical diverticulum short, tubular and narrow, pre-apical diverticulum long and sac like.

Material examined: 15 F, 8 M, Kashmir: Kupwara,

Handwara, Shatgund Payeen on grass, 6.ix.2005 (Shabir A. Reshi); 4 F, 9 M, Kupwara, Handwara, Shatgund Payeen on grass, 11.ix.2006 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from the stony soil having sparse vegetation along the river bank.

Remarks: This species has earlier been recorded from Kashmir by Bie-Bienko and Mischenko (1951). But the material collected by the authors slightly differs from the description given by Bie-Bienko and Mischenko in having hind tibia without dark band, instead it is having white band. It also differs from the description given by Kirby (1914) in having median carina present on pronotum.

Genus *Oedaleus* Fieber

Oedaleus Fieber, 1853. *Lotos.*, 3: 126 (as subgenus of *Oedipoda* Serville). *Oedaleus* Stal, 1873. *Recens. Orth.*, 1:123 (as subgenus of *Pachytylus* Fieber). Type-species: *Acrydium nigrofasciatum* Degeer.

Distribution: Africa, Arabia, S. Europe, Middle East, erstwhile USSR, China, Oriental region, Australia.

Diagnosis: Medium sized insects; antennae filiform, longer than head and pronotum together; fastigium of vertex flat or slightly concave with obtuse lateral carinulae, with or without median longitudinal carinula; frontal ridge flat or shallowly sulcate with marginal carinulae diverging ventrally, reaching or nearly reaching upto clypeus; pronotum with obtuse median carina, often intersected by posterior transverse sulcus, lateral carinae absent, dorsum with x-shaped pattern, metazoan equal to or little longer than prozona, posterior margin rounded or angular; mesosternal interspace wider than long, widening posteriorly; tegmina and wings fully developed, spurious median vein approximately equidistant between M and CuA, sometimes closer to CuA than M at base, wings usually with a dark band; hind femur with external ventral

knee lobe acutely rounded; arolium of medium size or small; male with supra-anal plate angular, cercus conical with obtuse apex, subgenital plate conical with obtuse apex; females with ovipositor valves robust, curved, ventral valve with elongate external lateral projection, spermatheca with sac like apical diverticulum with or without a short pre apical diverticulum.

The genus can easily be distinguished from other genera on the basis of having a light x-shaped marking on the dorsum of pronotum.

The genus is represented by three species in Kashmir.

Key to species of the genus *Oedaleus* Fieber found in Kashmir

1. Dark band of the hind wing reaches anteriorly to the anterior margin; spermatheca with small apical diverticulum 2
 ---Dark band of the hind wing not reaching to the anterior margin; spermatheca without apical diverticulum..... *Oedaleus abruptus* (Thunberg)
2. Pronotum with posterior transverse sulcus placed behind the middle; hind wing pale pink at base *Oedaleus roscens* Uvarov
 ---Pronotum with posterior transverse sulcus placed at the middle; hind wing pale yellow at base *Oedaleus senegalensis* (Krauss)

Oedaleus abruptus (Thunberg) (Fig. 4)

Gryllus abruptus Thunberg, 1815. *Mem. Acad. Sci. St. Petersburg.*, 5:233.

Pachytylus (Oedaleus) abruptus Stal, 1873. *Recens. Orth.*, 1:127. *Oedaleus (Oedaleus) abruptus* Saussure, 1884. *Mem. Soc. Phys. Hist. Nat. Geneve*, 28(1): 117.

Oedaleus abruptus (Thunberg), Kirby, 1910. *Syn. Cat. Orth.* 3: 226.

Distribution: Afghanistan, India, China, Myanmar, Nepal, Srilanka, Thailand.

The distinguishing characters of this species are same as described under genus and in the key to species.

Material examined: 3 F, 1 M, Kashmir: Kupwara, Handwara, Shatgund Payeen on grass, 27.ix.2006 (Shabir A. Reshi); 4 F, 5 M, locality same as above, 03.x.2006 (Shabir A Reshi).

Habitat: The specimens of this species have been collected from the cultivated field having mixed vegetation of maize, sorghum and grasses along the river bank.

Remarks: This species has been recorded for the first time from Kashmir (India). Earlier, Perwin *et al.* (1985) recorded it from Muzaffarabad (POK).

***Oedaleus rosescens* Uvarov**

Oedaleus rosescens Uvarov, 1942. *Ann. Mag. Nat. Hist.*, 9(11): 589.

Distribution: India (Rajasthan, Punjab), N.E. Pakistan.

Material examined: 4 F, 3 M, Kashmir: Kupwara, Handwara, Shatgund Payeen on grass, 27.ix.2006 (Shabir A. Reshi).

Habitat: The specimens of this species have also been collected from the cultivated field having mixed vegetation of maize, sorghum and grasses along the river bank.

Remarks: This species has also been recorded for the first time from Kashmir.

***Oedaleus senegalensis* (Krauss) (Fig. 5)**

Pachytylus senegalensis Krauss, 1877. *Sber. Acad. Wiss. Wien.*, 76(1): 56.

Ctypohippus arenivolans Butler, 1881. *Proc. Zool. Soc. Lond.* 85.

Pachytylus mlokoziejewitzeki Bolivar, 1884. *Ann. Soc. Ent. Belg.*, 28: 105.

Distribution: North Africa, erstwhile USSR, Middle East, Afghanistan, Pakistan, India.

Material examined: 4 F, 2 M, Kashmir: Kupwara, Handwara, Shatgund Payeen on grass, 27.ix.2006 (Shabir A. Reshi).

Habitat: Same as in above mentioned two species.

Remarks: This species has also been recorded for the first time from Kashmir.

Genus *Trilophidia* Stal

Trilophidia Stal, 1873. *Recens. Orth.*, 1: 131.

Type-species: *Trilophidia cristella* Stal

Distribution: Ethiopian region, Oriental region and some parts of Palaearctic region

Diagnosis: Smaller sized insects; antennae short, slightly or distinctly widened apically, usually longer than head and pronotum together; fastigium of vertex concave with truncate apex and undulated lateral carinulae; fastigial foveolae irregularly triangular or oval, sometimes indistinct; frontal ridge sulcate; pronotum with median carina distinct in prozona with two teeth like projections due to deeply incised anterior sulci and it seems to be bidentate in profile, lateral carinae irregular, forming small teeth like lateral tubercles in front of first sulcus, strongly diverging or sometimes weak in metazona, metazona longer than prozona, slightly inflated, posterior margin rectangular with obtuse apex; mesosternal interspace wider than long; tegmina and wings fully developed, tegmina with spurious median vein come closer to M than CuA apically, hind wings without band, slightly coloured or colourless at base; female with spermatheca having short apical and large sac like pre-apical diverticula; ovipositor valves short, with robust curved valves, ventral valve with small rounded externo-lateral projection.

This genus can easily be distinguished from other genera on the basis of having two teeth like projections on prozona of pronotum.

The genus is represented by a single species in Kashmir.

***Trilophidia annulata* (Thunberg) (Fig. 6)**

Gryllus annulatus Thunberg, 1815.

Mem. Acad. Sci. St. Petersb., 5: 234.

Oedipoda cristella Stal, 1860. Engenic's *Resa. Orth. Stockholm*, 3: 344.

Epacromia aspera Walker, 1870. *Cat.Derm.Salt.Br. Mus.*, 4: 775.

Distribution: India, Pakistan, Bangladesh, Srilanka, Myanmar, China, South East Asia.

Material examined: 1 F, 3 M, Kashmir: Baramulla, Uri, Uranbuha on maize, 13.ix.2005 (Shabir A. Reshi); 4 F, 5 M, Kupwara, Karnah, Gundi Gujran on grass, 24.ix.2005 (Shabir A. Reshi); 3 F, 3 M, Srinagar, Dachigam National Park on grass, 12.x.2006 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from the fields having mixed vegetation of maize, sorghum and grasses and from the fields having short grasses and thorny vegetation.

Remarks: This species has earlier been recorded by Hollis (1965) from Kashmir, later Bhat & Qadri (1999) recorded it from Dachigam National Park.

Genus *Acrotylus* Fieber

Acrotylus Fieber, 1853. *Lotos*, 3: 125.

Type-species: *Gryllus insubricus* Scopoli.

Distribution: Asia, Australia, Africa, South Europe.

Diagnosis: Small or medium sized insects; body covered with hairs; antennae filiform, longer than head and pronotum together; fastigium of vertex concave with margins raised; fastigial foveolae usually present, triangular in shape, sometimes indistinct; frontal ridge wide, sulcated, narrowing upwards, pronotum constricted just before middle, with well developed median and irregular tuberculate lateral carinae, which are sometimes absent in metazoan, median carina intersected by two transverse sulci, metazoan longer than prozona, its posterior margin broadly rounded; tegmina and wings fully developed; spurious median vein of tegmina close to CuA at base but at apex it is close to M; wings coloured at base with or without a dark band; hind tibia with inner pair of spur longer than outer pair.

The genus can easily be distinguished from other genera on the basis of having pronotum with

indistinct median carina on prozona intersected by two transverse sulci, posterior margin broadly rounded.

The genus is represented by a single species in Kashmir.

Acrotylus humbertianus Saussure (Fig. 7)

Acrotylus humbertianus Saussure, 1884. *Mem. Soc. Phys. Hist. Nat. Geneve*, 28(9): 189.

Distribution: India, Pakistan, Srilanka, Afghanistan.

Material examined: 4 F, 6 M, Kashmir: Baramulla, Gurez, Dawar on grass, 16.ix.2006 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from rocky soil having sparse vegetation.

Remarks: This species has earlier been recorded by Bei-Bienko and Mischenko (1951) from Kashmir.

Genus *Aiolopus* Fieber

Aiolopus Fieber, 1853. *Lotos*, 3: 100.

Epacromia Fischer, 1853. *Orth. Eur.*, 296, 360.

Aeolopus (Sic) Kirby, 1910. *Syn. Cat. Orth.*, 3: 120

Aeoloptilus Bei-Bienko, 1966. *Zool. Zh.*, 45: 1793.

Type-species: *Gryllus thalassinus* Fabricius

Distribution: India, Australia, Europe and Africa.

Diagnosis: Medium sized insects; antennae filiform as long as or longer than head and pronotum together; fastigium of vertex elongated, slightly concave with well developed lateral carinulae; fastigial foveolae present, elongate trapezoidal anteriorly reaching the fastigium of vertex; frontal ridge flat, more rarely with a groove; pronotum with median carina thin, low intersected by one transverse sulcus in front of the middle, lateral carinae absent, metazoan longer than prozona, its posterior margin obtuse angular, with rounded or obtuse apex; mesosternal interspace slightly wider than long; tegmina and wings fully developed; spurious median vein of tegmina sharp, strongly approaching M on the apex or nearly touching it; wings without dark band near the base colourless or slightly tinted; male with supra-anal plate elongate angular, cercus narrow conical with obtuse

apex; subgenital plate subconical with obtuse apex.

The genus can easily be separated from other genera on the basis of having pronotum with prozona constricted and without lateral carinae.

The genus is represented by single species in Kashmir.

***Aiolopus thalassinus* (Fabricius) (Fig. 8)**

Gryllus thalassinus Fabricius, 1781. *Species Insectorum*, 1:367.

Distribution: Ethiopian region, North-West India, Palaearctic region.

Material examined: 4 F, 5 M, Kashmir: Kupwara, Handwara, Nowgam on grass, 28.viii.2004 (Shabir A. Reshi); 8 F, 6M, Srinagar, Dachigam National Park on grass, 11.ix.2004 (Shabir A. Reshi); 2 F, 7 M, Baramulla, Palhalan on maize, 28.x.2005 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from the grassy fields.

Remarks: This species has been recorded from Kashmir for the first time.

Genus *Dittopternis* Saussure

Dittopternis Saussure, 1884. *Mem.Soc. Phys.Nat. Hist. Geneve*, 28(9): 52,125.

Type-species: *Dittopternis ceylonica* Saussure

Distribution: India, Srilanka, Australia, South Africa.

Diagnosis: Medium sized insects; head broad; antennae longer than head and pronotum together; fastigium of vertex concave, longer than broad; frontal ridge sulcated; pronotum with median carina intersected by the principal sulcus before the middle, front border truncated, hind border rectangular with tips rounded; tegmina and

wings fully developed, tegmina long, narrow densely reticulated, opaque beyond the middle, wings with base coloured followed by a curved black band, wings reaching beyond the abdomen; hind tibia with external apical spine absent, spines yellow with tips black, inner pair of spurs at the apex comparatively longer than the outer pair, upper carina of hind femur with spinules; male epiphallus with bridge broad, ancorae with tips pointed, lophi bilobate; female with ovipositor valves having blunt tips.

The genus is represented by a single species from Kashmir.

***Dittopternis venusta* (Walker) (Fig. 9)**

Oedipoda venusta Walker, 1870. *Cat. Derm.Salt.Br.Mus.*, 4: 740.

Distribution: India.

Material examined: 5 F, 5 M, Kashmir: Baramulla, Uri, Chandanwari on maize, 8.ix.2004, (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from Maize fields adjacent to forest.

Remarks: This species has been recorded for the first time from Kashmir. Earlier Sharma and Gupta (1977) have recorded it from Jammu region of J & K state.

Genus *Gastrimargus* Saussure

Gastrimargus Saussure, 1884.

Mem.Soc.Phys. Nat. Hist. Geneve, 28(9): 109,110.

Type-species: *Gryllus verescens* Thunberg

Distribution: Asia, Australia, Africa.

Diagnosis: Medium to large sized insects; antennae filiform, about as long as or shorter than head and pronotum together; fastigium of vertex with truncate apex and well developed lateral and weakly developed

median carinulae; fastigial foveolae if visible elongate and triangular; frontal ridge flat, wide with obtuse lateral carinulae; pronotum longer with sharply raised median carina which is sometimes entire and sometimes cut by only weak posterior sulcus, lateral carinae absent, x-shaped marking absent, rarely present, metazona longer than prozona, its posterior margin acutely angular; mesosternal interspace wider than long; tegmina and wings fully developed, reaching beyond the apex of abdomen; spurious median vein closer to M than CuA throughout its length, dark band of the wings variable, basal area of the wing pale blue, pale greenish, yellow, pale yellow or bright sulphur yellow.

The genus can easily be separated from other genera on the basis of having pronotum with median carina raised, crest like, entire or intersected by one transverse sulcus, posterior margin acutely angular.

The genus is represented by two species in Kashmir.

Key to species of *Gastrimargus* Saussure found in Kashmir

1. Median carina of pronotum distinctly intersected by posterior transverse sulcus; inner margins of hind femur blue black in colour.....*G. africanus* Saussure
- Median carina of pronotum not distinctly intersected by posterior transverse sulcus; inner margins of hind femur dirty yellow in colour.....*G. marmoratus* Thunberb

***Gastrimargus africanus* Saussure (Fig. 10)**
Oedaleus (Gastrimargus) marmoratus var. *africana* Saussure, 1888. *Mem. Soc. Phys. Nat. Hist. Geneve*, 30(1): 39.

Distribution: India: Kashmir, H.P., Bihar, Goa, Pakistan, Africa, South of Sahara, S.W. Africa.

Diagnosis: The characteristic features of the species are same as described under genus and in the key to species. Some additional

characters are as follows:

Hind tibia reddish apically, the inner pair of spurs longer than outer pair; male epiphallus with large bridge, lophi bilobate; female with supra-anal plate subtriangular, sugenital plate with posterior margin wavy, egg guide long, dorsal ovipositor valve with incurved blunt tip, as long as lateral apodeme, ventral valve with concave depression.

Material examined: 6F, 3M, Kashmir: Kupwara, Handwara,, Nowgam on grass, 28.viii.2004 (Shabir A. Reshi); 6F, 3 M, Baramulla, Uri, Chandanwari on grass, 13.ix.2005 (Shabir A. Reshi); 2F, 11M, Srinagar, Dachigam National Park on grass, 22. ix.2005 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from the grassy range land surrounded by forest and from fields having mixed vegetation of grasses and bushes.

Remarks: This species has earlier been recorded from Kashmir by Bhat & Qadri (1999). Mahmood and Yousuf (1999) also recorded it from POK.

***Gastrimargus marmoratus* (Thunberg)**
Gryllus marmoratus Thunberg, 1815. *Mem. Acad. Sci. St. Petersb.*, 5: 232.

Distribution: India: Kashmir, Assam; Japan.

The collected specimens fully agree with the description given by Bei-Bienko and Mischenko (1951) and Ritchie (1982).

Material examined: 3 F, 4 M, Kashmir: Baramulla, Uri, Chandanwari on grass, 01.ix. 2007 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from range land surrounded by forest.

Remarks: This species has earlier been

recorded from Kashmir by Bei-Bienko and Mischenko (1951).

Genus *Locusta* Linnaeus

Locusta Linnaeus, 1758. *Syst. Nat.*, 1: 431.

Oedipus Berthold, 1827. *Weimar, Indistr. Compt.*, 402.

Pachytylus Fieber, 1853. *Lotos*, 3: 121.

Type-species: *Gryllus (Locusta) migratorius* Linne.

Distribution: All over the world.

Diagnosis: Large sized insects; antennae filiform, about as long as head and pronotum together; fastigium of vertex slightly concave, not delimited anteriorly from the frontal ridge and extending roundly over into it; frontal ridge wide, flat, slightly constricted and depressed at the median ocellus; median carina of pronotum slightly concave or arcuate, intersected by posterior transverse sulcus, metazona slightly longer than prozona, its posterior margin almost rounded or obtusely angular; mesosternal interspace about as long as wide or slightly longer; thorax ventrally with dense hairs making tomentum; tegmina and wings fully developed; spurious median vein of tegmina closer to CuA than to M, wings without dark band; male with supra-anal plate angular, cercus with obtuse apex, subgenital plate conical with subacute apex; female ovipositor short, robust with curved valves, ventral valve with angular, external, lateral projections. The genus can easily be separated from other genera on the basis of having thorax on the ventral side covered with dense hairs; wings without dark band; body robust.

The genus is represented by a single species in Kashmir.

***Locusta migratoria* Linnaeus (Fig. 11)**

Gryllus (Locusta) migratoria Linnaeus, 1758. *Syst. Nat.* 1(10): 432.

Distribution: India, Pakistan, Kazakistan,

Africa, Southwestern Pacific.

Material examined: 3 F, 2 M, Kashmir: Baramulla, Gurez, Dawar on maize, 18.ix.2004 (Shabir A. Reshi).

Habitat: The specimens of this species have been collected from maize fields along the river bank (Kishan Ganga) at an altitude of 8000ft.

Remarks: This species has been recorded for the first time from Kashmir (India). Earlier, Mahmood and Yousuf (1999) recorded it from POK.

Genus *Leptopternis* Saussure

Shingonotus (Leptopternis) Saussure, 1884.

Memoires de la Societe de Physique et

D'Histoire Naturelle de Geneve, 28(9): 193.

Type-species: *Oedipoda gracilis* Eversmann

Distribution: From Northwestern Mongolia and Dzungaria to Sahara.

Diagnosis: Medium sized insects; antennae filiform, longer than head and pronotum together; fastigium of vertex concave, lateral carinulae present; fastigial foveolae present, triangular; frontal ridge shallowly concave; pronotum with linear median carina, lateral carinae absent, dorsum crossed by three sulci, metazona longer than prozona, its posterior margin obtusely angular; mesosternal interspace wider than long; tegmina and wings fully developed, wings without dark band; male with supra-anal plate elongate and angular, cercus narrow, conical with obtuse apex, epiphallus with a narrow bridge, ancorae large, lophi bilobate; females with acutely produced ovipositor valves.

The genus is represented by a single species in Kashmir.

***Leptopternis gracilis* (Eversmann)**

Oedipoda gracilis Eversmann, 1848. *Addit. Fisch. Waldh. Orth. Ross.*, 10.

The species has been recorded from Kashmir by Bei-Bienko and Mischenko (1951). Later, Mahmood and Yousuf (1999) recorded it from POK. However, the present authors could not collect any specimen of this species.

Genus *Pternoscirta* Saussure

Pternoscirta Saussure, 1884. *Mem. Soc. Geneve*, 28(9): 52, 127.

Type-species: *Pternoscirta cinctifemur* (Walker)

Distribution: Oriental region.

Diagnosis: Medium sized insects; ventral part of body and legs with long dense hairs; head short, somewhat rugose; vertex short, wide, flat; fastigial foveolae not reaching to the anterior margin of fastigium; pronotum slightly roughened with small sparse tubercles, median carina distinct, moderately raised; opening of tympanal organ widely uncovered; spurious median vein of tegmina comes closer to M than CuA apically, wings coloured basally, dusky on the apex and along the anterior margin, dark band absent; hind tibia with inner pair of spurs longer than the outer pair; arolium nearly equal to half the length of claw.

The genus is represented by a single species in Kashmir.

***Pternoscirta caliginosa* (DeHaan)**

Acridium (Oedipoda) caliginosum De Haan, 1842. *Tem. Verh. Orth.* 161.

Distribution: India (Kashmir, Sikkim), South China, Malacca.

Remarks: The species has been recorded from Kashmir by Bei-Bienko and Mischenko (1951). However, the present authors could not collect any specimen of this species.

Genus *Epacromius* Uvarov

Epacromius Uvarov, 1942. (1941). *Trans. Amer. Ent. Soc.*, 67: 337, 338.

Type-species: *Epacromius tergestinus* Charpentier

Distribution: Palaearctic & Oriental regions.

Diagnosis: Medium sized insects; body slender; fastigium of vertex with apex rounded; fastigial foveolae well developed, elongated; frontal ridge flat or shallowly sulcate at least in males; pronotum with median carina thin, low, lateral carinae absent; mesosternal interspace open; tegmina and wings fully developed, spurious median vein of tegmina often irregular, extending along the middle field or runs moderately close to M apically; male subgenital plate flattened.

The genus is represented by a single species in Kashmir.

***Epacromius coerulipes* (Ivano)**

Epacromius coerulipes Ivano, 1887. *Trudy obshchestva Ispytatelei prirody Khar'kovskogo Universiteta*, XXI: 348.

Distribution: Europe, Kazakhstan, Australia, Hungary, Mongolia, Korea, China.

Remarks: The species has been reported from Kashmir by Bei-Bienko and Mischenko (1951). However, the present authors could not collect any specimen of the species.

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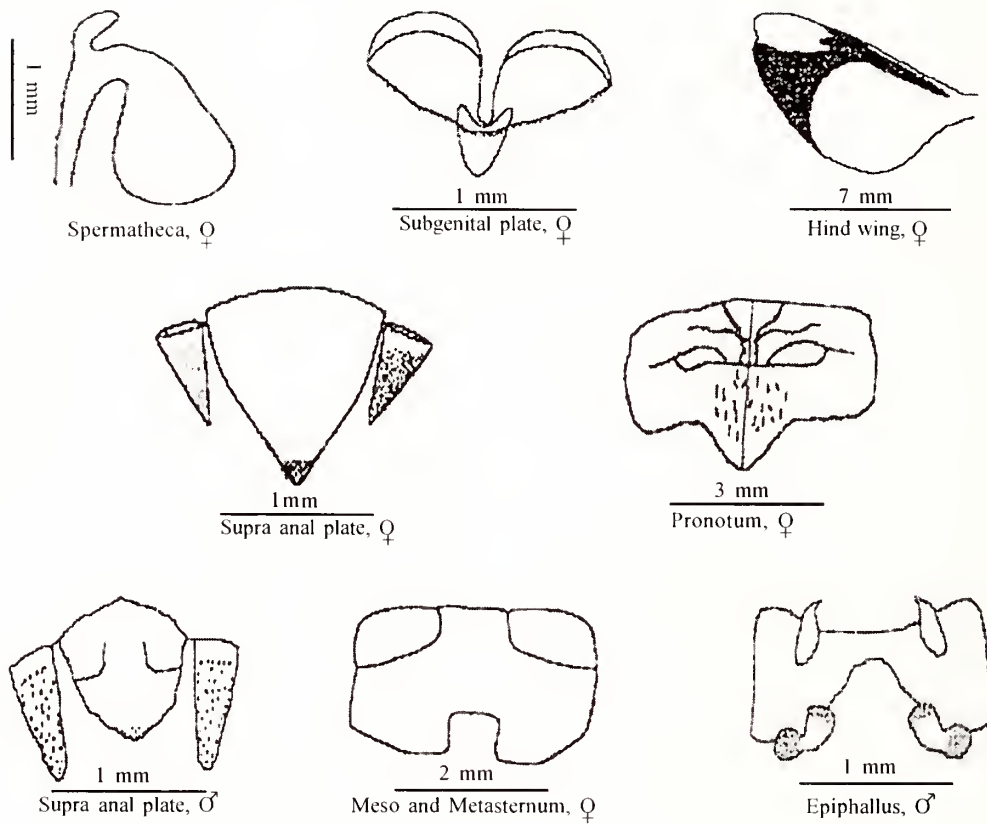


Fig. 1: *Oedipoda miniata miniata* (Pallas)

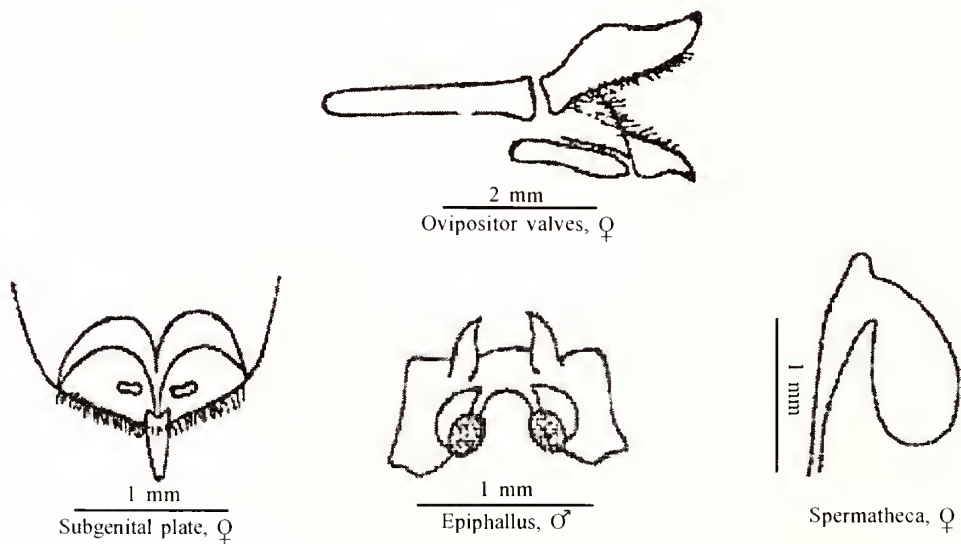


Fig. 2: *Sphingonotus savignyi* Saussure

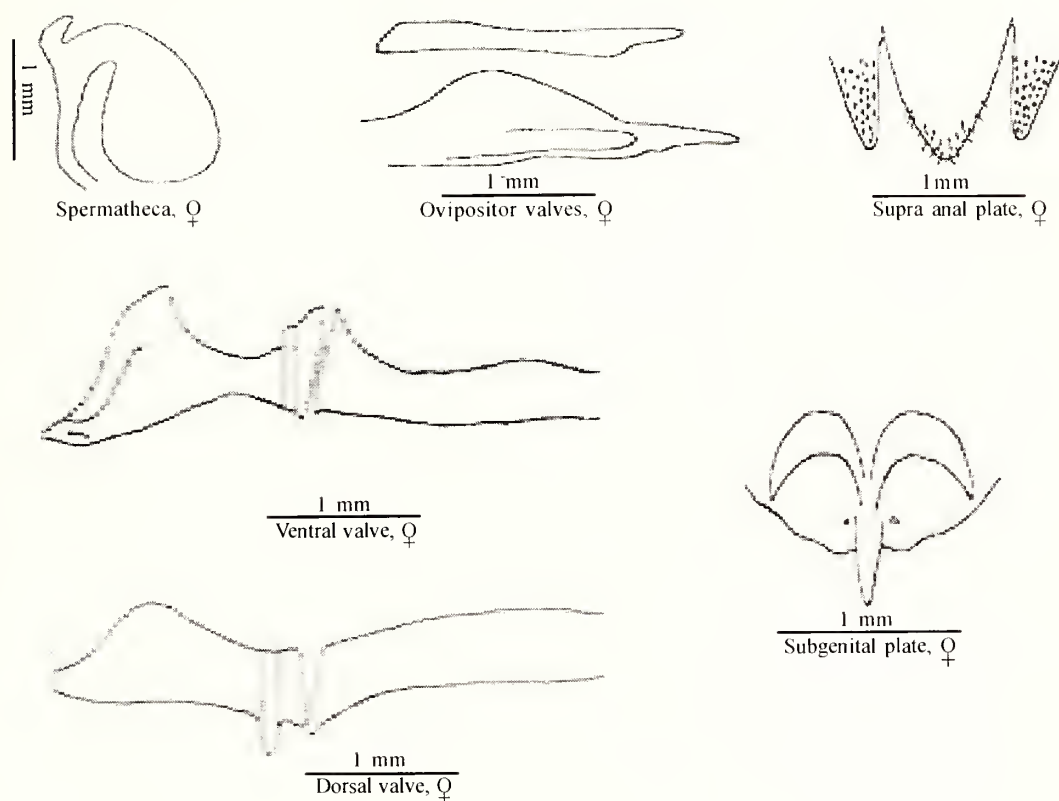


Fig. 3: *Sphingonotus longipennis* Saussure

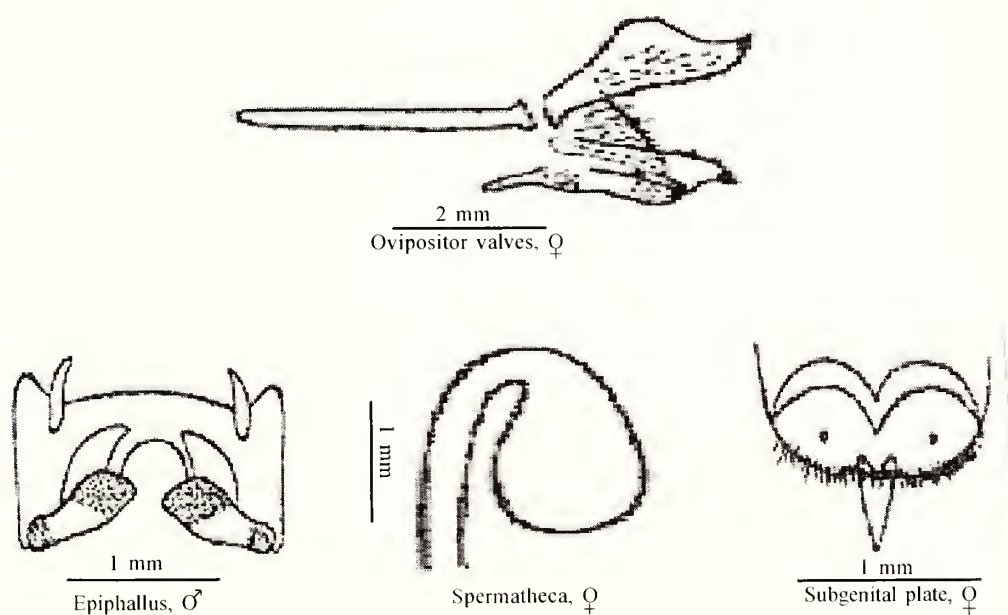


Fig. 4: *Oedaleus abruptus* (Thunberg)

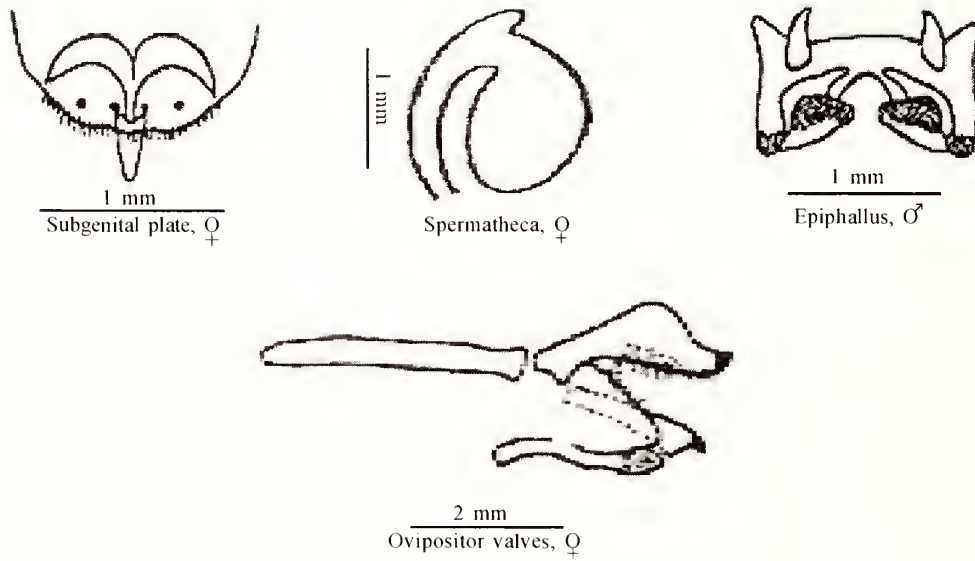


Fig. 5: *Oedaleus senegalensis* (Krauss)

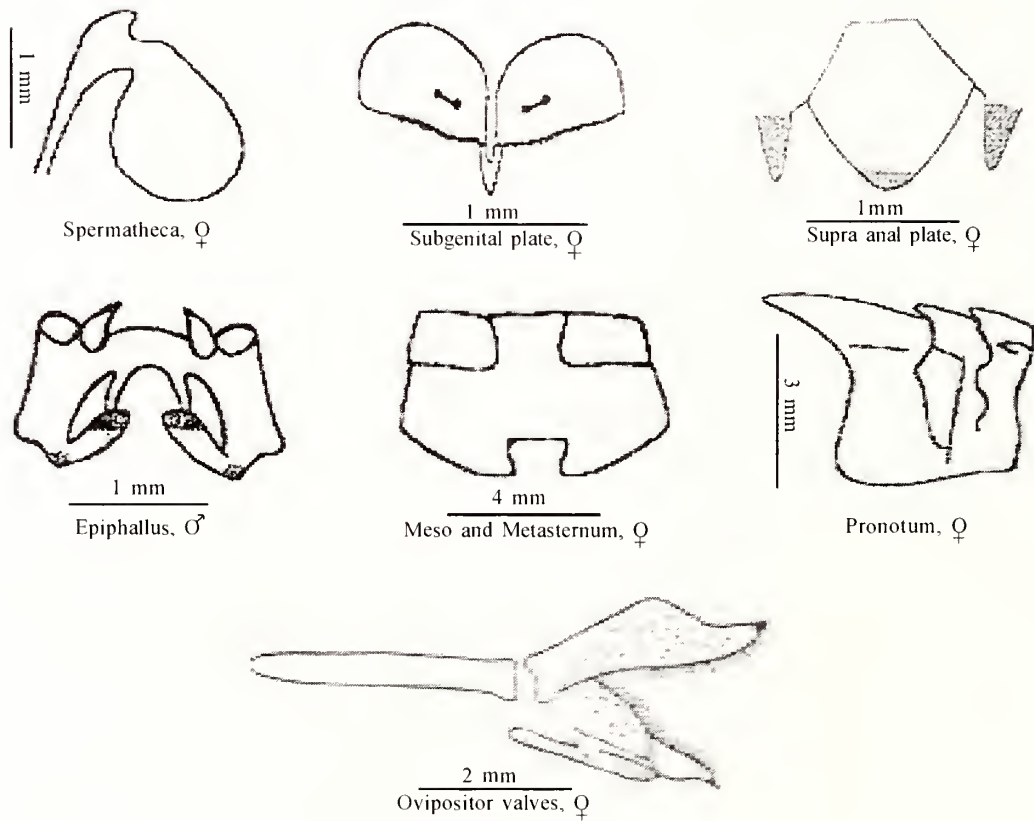


Fig. 6: *Trilophidia annulata* (Thunberg)

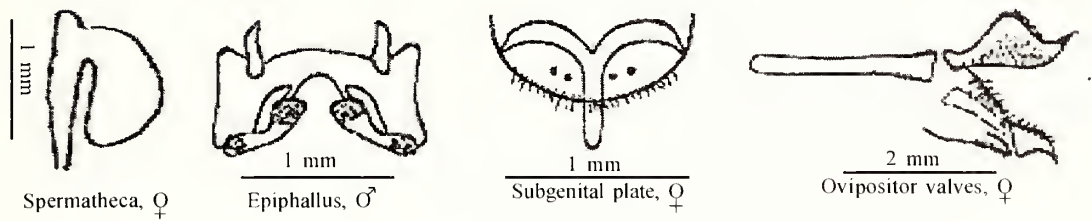


Fig. 7: *Acrotylus humbertianus* Saussure

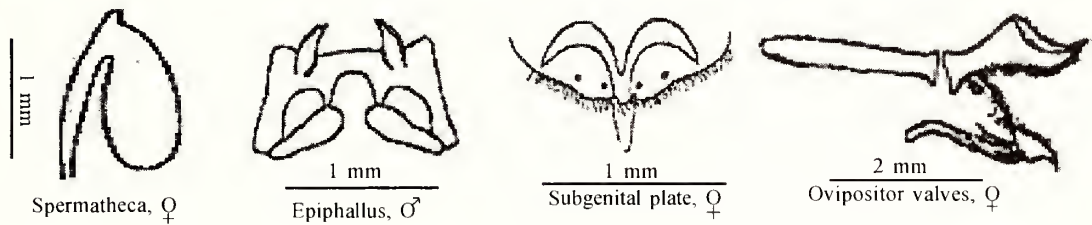


Fig. 8: *Aiolopus thalassinus* (Fabricius)

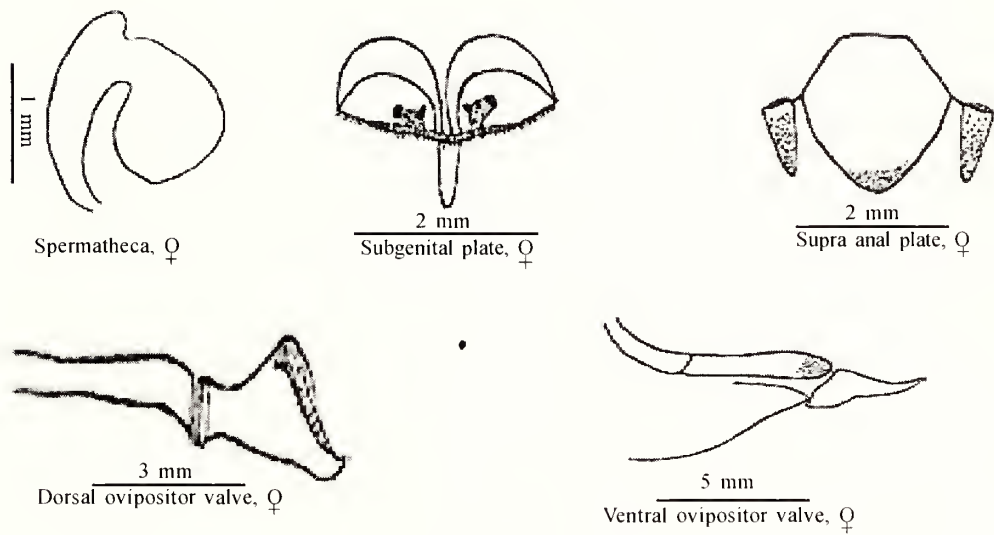


Fig. 9: *Dittopternis venusta* (Walker)

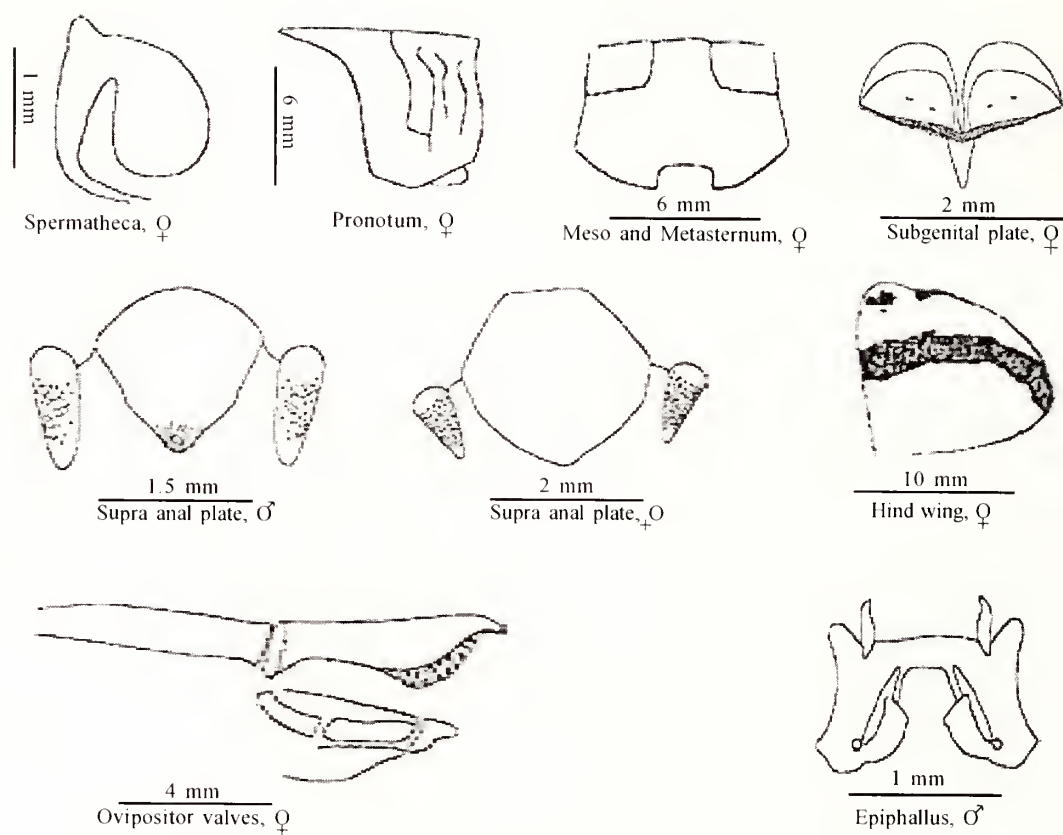


Fig. 10: *Gastrimargus africanus* Saussure

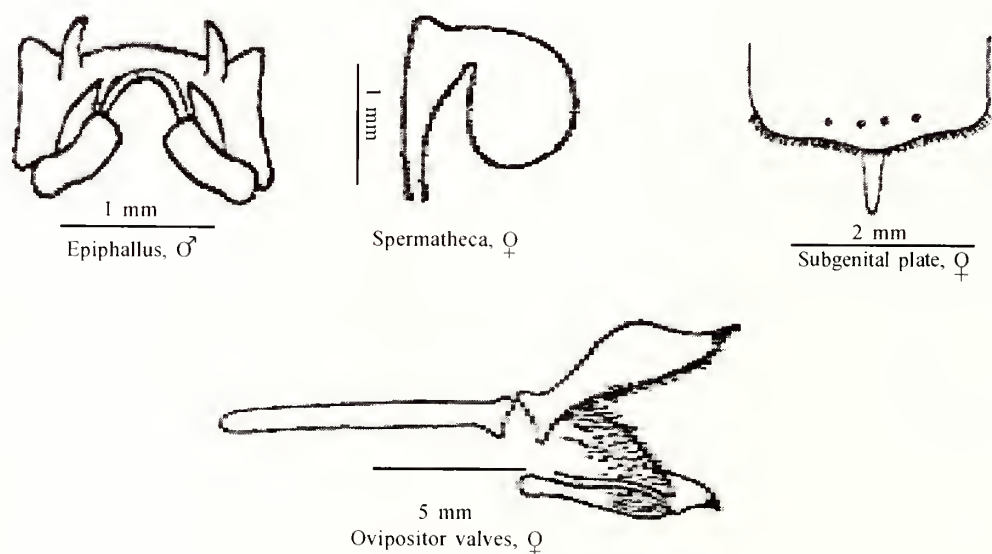


Fig. 11: *Locusta migratoria* Linn.

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